



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,097	01/18/2007	Katsunori Akiyama	4914-0103PUS1	5908
2292 7590 10/10/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER KOSLOW, CAROL M				
ART UNIT		PAPER NUMBER		
1793				
NOTIFICATION DATE		DELIVERY MODE		
10/10/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

**Application No.**

10/550,097

**Applicant(s)**

AKIYAMA ET AL.

**Examiner**

C. Melissa Koslow

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29 is/are allowed.
- 6) ☒ Claim(s) 1-21, 23 and 25-28 is/are rejected.
- 7) ☒ Claim(s) 22 and 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 9/21/05, 10/19/06
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

The article cited in the Information Disclosure statement of 21 September 2005 has been considered with respect to the provided concise explanation. The Japanese language patent documents cited in the Information Disclosure statement of 21 September 2005 have been considered with respect to the provided English abstracts.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The formula of claim 15 is not found in the specification. The teaching in the specification indicates that La is completely replaced in LaTaO<sub>4</sub>. It is suggested to insert the formula into the specification to overcome this objection.

Claims 2, 6, 21 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 is indefinite since the variables X and Y are not defined. Claims 6 and 28 are duplicates. Applicant is advised that should claim 6 be found allowable, claim 28 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). Claim 21 is improperly dependent from claim 1 since the definition of B in claim 1 does not allow for mixtures and Zr is not a choice.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 6, 11-13, 19, 20 and 28 are rejected under 35 U.S.C. 102(a) as being anticipated by EP 1,331,208.

This reference teaches the materials  $\text{La}_2\text{Ti}_2\text{O}_7$ ,  $\text{Nd}_2\text{Ti}_2\text{O}_7$ ,  $\text{Ca}_2\text{Nb}_2\text{O}_7$ , a mixture of  $\text{La}_2\text{Ti}_2\text{O}_7$  and  $\text{Nd}_2\text{Ti}_2\text{O}_7$ ; a mixture of  $\text{ZrO}_2$  with at least one of  $\text{La}_2\text{Ti}_2\text{O}_7$  and  $\text{Nd}_2\text{Ti}_2\text{O}_7$ ; a mixture of  $\text{ZrO}_2$  with  $\text{Ca}_2\text{Nb}_2\text{O}_7$  and a mixture of  $\text{Ca}_2\text{Nb}_2\text{O}_7$  with at least one of  $\text{La}_2\text{Ti}_2\text{O}_7$  and  $\text{Nd}_2\text{Ti}_2\text{O}_7$ . The reference teaches the claimed materials.

Claims 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by the teachings in Example 3 of the specification.

This example admits Fosterite ( $\text{Mg}_2\text{SiO}_4$ ), Liebenbergite ( $\text{Ni}_2\text{SiO}_4$ ), Fayalite ( $\text{Fe}_2\text{SiO}_4$ ), Tephrite ( $\text{Mn}_2\text{SiO}_4$ ), Olivine ( $[\text{Mg},\text{Fe}]_2\text{SiO}_4$ ), Monticellite ( $[\text{Mg},\text{Ca}]_2\text{SiO}_4$ ), Knebelite ( $[\text{Mn},\text{Fe}]_2\text{SiO}_4$ ), Glaucochroite ( $[\text{Ca},\text{Mn}]_2\text{SiO}_4$ ) and Kirschsteinite ( $[\text{Ca},\text{Fe}]_2\text{SiO}_4$ ) are all known minerals. Thus these known minerals anticipate the claimed materials.

Claim 26 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 6,190,579.

This reference teaches  $\text{SrYb}_2\text{O}_4$  in column 7, line 36 and in claim 9. The reference teaches the claimed material.

Claims 1, 4, 12, 13 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 6,093,338.

Column 21, lines 45-46 teaches the materials  $\text{Sr}_3\text{Ti}_2\text{O}_7$  and  $\text{Sr}_4\text{Ti}_3\text{O}_{10}$ . Column 23, lines 51-55 teaches the materials  $\text{Sr}_2\text{Nb}_2\text{O}_7$ ,  $\text{Sr}_2\text{Ta}_2\text{O}_7$ ,  $\text{Ca}_2\text{Nb}_2\text{O}_7$ ,  $\text{Ca}_2\text{Ta}_2\text{O}_7$ ,  $\text{La}_2\text{Ti}_2\text{O}_7$  and  $\text{La}_2\text{Ta}_2\text{O}_7$ . The reference teaches the claimed material.

Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by JP 10-330157.

This reference teaches the materials  $\text{Sr}_3\text{Ti}_2\text{O}_7$  and  $\text{Sr}_4\text{Ti}_3\text{O}_{10}$ . The reference teaches the claimed material.

Claim 27 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 5,114,742.

This reference teaches the material  $\text{Sc}_6\text{WO}_{12}$ . The reference teaches the claimed material.

Claims 5, 12, 13 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 5,013,360.

This reference teaches the materials lanthanum niobates,  $\text{MgNb}_2\text{O}_6$ ,  $\text{La}_3\text{NbO}_7$ ,  $\text{LaNbO}_4$  and  $\text{LaTaO}_4$ . The reference teaches the claimed materials.

Claims 5, 12, 13, 15, 16, 18-20 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 5,008,221.

This reference teaches the materials  $\text{YNbO}_4$ ,  $\text{YTaO}_4$ ,  $\text{MTaO}_4$ ,  $\text{MnNbO}_4$ , where M is Mg, Ca, Sc, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb or Lu and the mixtures of zirconia and at least one of  $\text{YNbO}_4$  or  $\text{MnNbO}_4$ . The reference teaches the claimed materials.

Claims 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 4,986,933.

Column 2, lines 36-42 teaches the materials  $\text{BaTa}_2\text{O}_6$ ,  $\text{CaTa}_2\text{O}_6$ ,  $\text{FeTaO}_4$ ,  $\text{YTaO}_4$ ,  $\text{VTaO}_4$ ,  $\text{CrTaO}_4$ ,  $\text{GaTaO}_4$  and  $\text{InTaO}_4$ . The reference teaches the claimed materials.

Claims 2 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Chemical Abstract citation 1984:602152.

This abstract teaches the mineral  $\text{La}_{2-x}\text{Ca}_x\text{NiO}_4$  where it is clear that  $x$  is  $0 < x < 2$ . The reference teaches the claimed materials.

Claims 12, 13 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 57-144546.

The abstract for this reference teaches  $\text{MNbO}_4$ , where  $M$  is Y, Eu, Gd or Dy. The reference teaches the claimed materials.

Claims 1, 5, 12, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 4,173,518.

This reference teaches the materials  $\text{La}_2\text{Ti}_2\text{O}_7$ ,  $\text{LaTaO}_4$ ,  $\text{LaNbO}_4$ ,  $\text{YTao}_4$  and  $\text{YNbO}_4$ . The reference teaches the claimed materials.

Claims 1, 6, 12, 19 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 4,030,937.

This reference teaches  $\text{La}_2\text{Ti}_2\text{O}_7$  (claim 1) and a mixture of 10-90 mol%  $\text{La}_2\text{Ti}_2\text{O}_7$  and 90-10 mol%  $\text{Sr}_2\text{Nb}_2\text{O}_7$  (table 1). The reference teaches the claimed materials.

Claims 2, 3 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 3,953,173.

This reference teaches the materials  $\text{La}_2\text{NiO}_4$ ,  $\text{Pr}_2\text{NiO}_4$ ,  $\text{Nd}_2\text{NiO}_4$  and  $\text{LaSrNiO}_4$ . The reference that the non-stoichiometric parameter is deleted unless needed, which suggests that it is 0 for these materials. The reference teaches the claimed materials.

Claims 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent 3,856,545.

Table 2 teaches the materials  $\text{CaMgSiO}_4$  and  $\text{Mg}_2\text{SiO}_4$ . The reference teaches the claimed materials.

Claim 29 is allowed.

Claims 22 and 24 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 21 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

There is no teaching or suggestion in the cited art of record of materials having the formulas  $\text{Sr}_2\text{Nb}_{2-x}\text{M}_x\text{O}_7$ ,  $\text{Sr}_4\text{Nb}_{2-x}\text{M}_x\text{O}_9$  and  $\text{BaTa}_{2-x}\text{M}_x\text{O}_6$ , where M is Ti or Zr and  $0 < x \leq 2$  or the mixture of  $\text{ZrO}_2$  and  $\text{Sr}_2\text{Nb}_{2-x}\text{M}_x\text{O}_7$ , where M is Ti or Zr and  $0 < x \leq 2$ .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (571) 272-1371. The examiner can normally be reached on Monday-Friday from 8:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at (571) 272-1233.

The fax number for all official communications is (571) 273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/cmk/  
October 10, 2008

/C. Melissa Koslow/  
Primary Examiner  
Art Unit 1793